WHEN HURRICANES STRIKE

Satellites Play a Critical Role in Saving Lives Before and After a Hurricane

Since 2005, 19 Atlantic hurricanes have hit the United States, causing more than 2000 casualties and damage estimated in the hundreds of billions of dollars

(Left) Since Hurricane Katrina, 28 U.S. States plus two U.S. Territories have been severely impacted by Atlantic hurricanes and tropical cyclones.

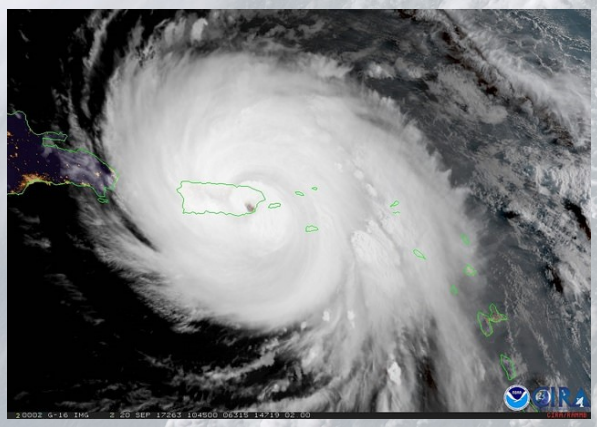
Satellites to the Rescue — For more than 55 years, satellites have been helping to save lives by supporting improved hurricane forecasting, preparation, search, rescue and recovery as well as everyday services, critical to citizens when disaster strikes.

ADVANCED WEATHER FORECASTING VIA SATELLITE

As weather predictions are vital to saving lives, the new Lockheed Martin manufactured GOES-R satellites with advanced imaging allows meteorologists and emergency responders to more quickly and accurately predict when and where hurricanes will strike. Spire Global utilizes small satellite GPS-RO weather data critical to industries and people across North America and the world. All this data is crucial as it helps local officials plan life-saving evacuations in areas predicted to be heavily impacted by severe weather.

Weather and imaging satellites provide life-saving data to forecasters and emergency officials. (Above) Artist Conception of GOES-R Weather Satellite Photo credit: Lockheed Martin

From Aug 27th to Sept 3rd, Hurricane Harvey devastated the Gulf Coast of Texas and Louisiana causing massive flooding and storm damage.



On Sept 20th, when Hurricane Maria made landfall in PR, land-based radar was disabled. The GOES-16 weather satellite provided forecasters with valuable real-time images like the one above. Photo credit: NOAA and GOES-R.gov

COMPARISON IMAGERY

Comparison Imagery - Before and After Imaging from satellite companies assists responders in locating areas of flooding and shelters/resources, performing search and rescues, evaluating damage to critical infrastructure, searching for navigable roads, and prioritizing aspects of the response and recovery.

(Above) Before and after Hurricane Maria in PR. Photo credit: DigitalGlobe (Below) Before and after Hurricane Irma destruction in USVI. Photo credit: Planet

CURRENT IMAGERY INITIATIVES

DigitalGlobe has released public imagery over affected areas during Harvey, Irma, and Maria. They have teamed with Team Rubicon and the United Nations. Humanitarian OpenStreetMap Tasks (HOT) are being provided imagery from DigitalGlobe's high-resolution satellite constellation.

Planet and its constellation of earth imaging satellites is supporting teams of volunteers, humanitarian organizations, and other coordinating bodies in relief efforts with daily imagery updates and analytical tools through its Disaster Response Program

SATELLITE COMMUNICATIONS

Satellite Communications Networks are highly survivable and robust compared to terrestrial communications infrastructure which may be damaged or destroyed in a hurricane. From federal, state and municipal public agencies including FEMA and NGO recovery organizations to everyday consumers, satellites provide robust services and business continuity when other networks are damaged, overloaded or unavailable. Satellite Communications also provides a load sharing or surge capacity solution and enable the creation of instant communications infrastructure.

CURRENT COMMUNICATION RESPONSE AND RECOVERY INITIATIVES

Hughes Network Services (HNS): In Texas, HNS worked with Response Force One in supporting FEMA shelters with satellite broadband for public/community use to check in with family and friends via VoIP and internet. In PR, HNS is supporting retail customers, including wholesalers, drug stores and others to ensure business can be carried on as usual. HNS is also supporting key USG agencies in PR and the USVI including FEMA and CBP with ensuring communications are up and operational. They are working to make donations to key relief organizations in the affected areas to ensure they have the services they need available to help the people who have been hit.

Inmarsat: In order to assist in the recovery effort, Inmarsat and its partners have donated and delivered rapidly deployed voice and high-speed data services including IsatPhone handheld satellite phones, BGAN (Broadband Global Area Network) and Global Xpress to support official emergency and disaster response teams, providing vital communications and other important services following hurricanes Harvey, Irma and Maria as well as recent earthquakes in Mexico. In addition to delivering satellite equipment and services, Inmarsat has made a donation to the American Red Cross to help those who have been affected.

Inmarsat Government: Small, rapidly deployable terminals like BGAN (Broadband Global Area Network) systems are providing internet and communications services to a number of government customers, and have done so during Harvey, Irma, and Maria responses. Inmarsat's networks are operating nominally over USVI and PR with additional Global Express capacity being steered into the region.

Iridium: There are over 3,100 unique Iridium subscribers in the Caribbean region right now which has enabled more than 221,000 total minutes of voice and data since Sept. 20. Iridium operations are continuing to monitor, support and service increased demand for voice, data and PTT services in PR, USVI and other islands in the Caribbean in need of satellite communications. The network is addressing the increased demand as expected.

CURRENT COMMUNICATION RESPONSE AND RECOVERY INITIATIVES (continued)

Intelsat: On St. John, USVI, Intelsat is supporting the Global Disaster Immediate Response Team (DIRT), a quick response international non-governmental organization (NGO) that provides medical assistance, communications access, and search and rescue support. Global Dirt is using IntelsatOne Flex and antennas and kits provided by Intelsat to support communications at multiple sites, including a medical clinic.

Intelsat is helping return communications to normal levels on PR, working with two major telecommunications companies to provide VSAT services to restore network operations for enterprise customers. The Intelsat Ku-band broadband service is helping banks and pharmacies open again as well as providing communications support for the Puerto Rican government and FEMA. The Intelsat-16 satellite has also been redeployed to provide further assistance in PR following Hurricane Maria.

Intelsat is also working with antenna manufacturer Kymeta and has donated Intelsat Epic^{NG} throughput to support the Liberty Global Wi-Fi tour caravan in PR. The Liberty Global tour will deliver Internet connectivity to 29 remote and damaged areas of the island. Working with Kymeta's steerable roof-mounted, flat panel antennas, the service will provide connectivity up to 20 Mbps forward and 1Mbps return.

Ligado: Ligado's satellite network is currently being used by the DHS, FEMA and the FBI in PR and USVI and usage has soared in the region. Ligado is working with the United Way's MISSION UNITED to meet the communications needs of those impacted by the Hurricane. Donated satellite phones and service are being used by public safety officials, volunteers, and community organizations in PR so that they can stay in touch with areas where the communications infrastructure has been destroyed. The Company has fulfilled all requests for additional satellite phones and network capacity to support government and NGO relief. Additionally, Ligado has responded to Hurricanes Harvey and Irma by getting hundreds of new satellite phone units into the hands of public safety officials and other first responders actively involved in disaster relief efforts.

O3b: O3b, an SES subsidiary, is using the Ka band through its Medium Earth Orbit non-geostationary satellite constellation to help bring local wireless networks in PR online while the terrestrial infrastructure is being repaired.

SES-GS: SES-GS is providing Ku capacity to U.S. Government Responders in PR and other islands in the Caribbean.

SES: SES is providing C-band services to relief workers in PR and utilization of Emergency.lu rapid deployment kits in Saint Martin, Sint Maarten and Dominica. These terminals were quickly brought in for use by responders in response to Irma and Maria to provide internet connectivity. Once installed, teams deployed Wi-Fi access points so that humanitarian aid organizations could have connectivity, numbering around 400 registrations. Emergency.lu was also used to restore communications at Princess Juliana airport. Additionally, SES provided C-band capacity at no charge for the benefit concert to benefit victims of hurricane Irma and Maria.

Telesat: In response to an urgent request from a telecommunications service provider (TSP), Telesat established two VSAT networks in PR following hurricane Maria, utilizing Telstar 12V capacity and hub VSAT services at Telesat's Mount Jackson Teleport. Telesat also assembled remote hardware kits that were delivered to the TSP customer in PR, and engaged an on-site field service representative to deploy the two networks and assist the TSP customer.

Viasat: ViaSat currently has broadband satellite coverage of the Continental United States plus Hawaii and Alaska, but not USVI or PR (with ViaSat-2 coming online later this fall, coverage will be available in those regions). During the recent events, in Texas and Florida, the NGO recovery teams deployed 26 ViaSat portable satellite broadband terminals to help volunteers connect online to provide critical medical attentions, place people in shelters, and continue to heal the impacted communities.

SATELLITE PHONES

Satellite phones from companies such as Iridium, Inmarsat, Ligado and Globalstar can provide a vital service to first responders, recovery teams and survivors cut off from the world who wish to reach out to family and loved ones.

(Left) On Oct 6th, a Coast Guard Tactical Law Enforcement Team South crewmember, gives a satellite phone to a local in PR so she can call her son in Alaska who she hasn't been in contact with since Hurricane Maria. Photo Credit: U.S. Coast Guard photo by Petty Officer 3rd Class Eric D. Woodall

SATELLITE CONNECTIVITY AND BROADBAND

Hurricane preparations—Satellites provide vital debit and credit card authorizations at gas stations and retail stores.

Retailers process everyday purchases using satellite data services before and after a hurricane strikes. Companies such as EchoStar. Hughes and Telesat provide reliable satellite support and business continuity to gas stations, grocery stores and retailers for point of sale (POS) credit/debit card authorizations and inventory management. Consumers purchase fuel, water, food and other essentials to prepare for hurricanes. Satellite data and broadband providers such as Hughes, ViaSat, Inmarsat and Telesat also provide essential lifesaving broadband and VSAT data services to response and recovery agencies, hospitals and others in regions cut off from terrestrial Internet and Wi-Fi.

SATELLITE BROADCAST

Satellites from companies such as Eutelsat, Intelsat, SES and Telesat support television news trucks and emergency responders to provide valuable onsite rescue and recovery information and services.

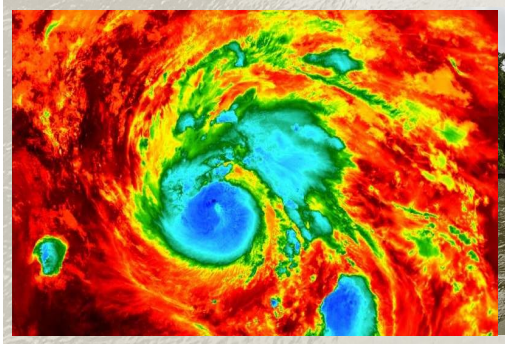
SiriusXM works with the Integrated Public Alert and Warning System (IPAWS) management office to distribute receivers in impacted regions such as PR and can dedicate additional channels to broadcast vital emergency safety information.

Satellite News Trucks pictured above were deployed following Hurricane Katrina.

CELLULAR COMPANIES ALSO DEPEND ON SATELLITES

Currently, AT&T is using satellite phones and both Verizon and AT&T are deploying satellite trucks in regions hit hard by recent hurricanes in order to restore service. T-Mobile and Sprint are using VSAT terminals to provide backhaul support for restoration of cellular and text service.

(Above) VSAT terminals restoring connectivity in PR (Photo credit: Colin Chaperon for the American Red Cross)



Hurricane Harvey Caused Massive Flooding in TX and LA (Photo credit DigitalGlobe.com and ESA)

Hurricane Sandy Destruction

SIA SATELLITE INDUSTRY ASSOCIATION
The Voice of the Satellite Industry

For More Information, please contact Tom Stroup, President, Satellite Industry Association via email at info@sia.org

Further reference materials: SIA Satellites to the Rescue Presentation, click HERE

SIA First Responders Guide for Satellite Communications, click HERE